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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Don Michael

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EXAMINER

FULK, STEVEN J

ART UNIT

PAPER NUMBER

2891

MAIL DATE

DELIVERY MODE

06/13/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/775,517	Applicant(s) MICHAEL ET AL.	
	Examiner Steven J. Fulk	Art Unit 2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) 6,8-23,30,31,48-53 and 56 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7,24-29,32-47,54 and 55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/9/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, Species A, claims 1-5, 7, 24-29, 32-47, 54 and 55, in the reply filed on May 3, 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Objections

2. Claim 34 is objected to because of the following informalities: Claim 34 recites the limitation "said fluid". There is insufficient antecedent basis for this limitation in claim 34 or claim 32. Claim 34 should apparently depend from claim 33. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-5, 7, 24-29, 32, 35-36, 39, 41, 43-47 and 54-55 are rejected under 35 U.S.C. 102(b) as being anticipated by Jordan et al. '862.

Regarding claims 1 and 2, Jordan et al. discloses a package for a micro-electromechanical device (MEMS package), comprising: an inner enclosure having an inner cavity defined therein (fig. 1, 18); and a fill port channel communicating with the inner cavity and of sufficient length to allow a quantity of adhesive to enter

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the fill port channel while preventing the adhesive from entering the inner cavity, wherein the fill port channel extends at least partially into the inner enclosure (fill port 34 and channel between 34 and cavity 18).

Regarding claims 3-5 and 7, the reference further discloses the package to comprise a flow control peninsula structure extending at least partially into the inner enclosure (fig. 1, peninsula between 34 and 18) and wherein the flow control structure prevents the adhesive from entering the cavity by physically separating the fill port channel from the inner cavity; and comprising locking features formed on the flow control structure, wherein the locking features comprise tapered sections formed on the flow control structure to form a choke point in the fill port channel (34).

Regarding claims 24-29, Jordan et al. discloses a package for a micro-electromechanical device (MEMS device), comprising: an inner enclosure having an inner cavity (fig. 1, 18) defined therein; a fill port channel coupling the inner cavity to an atmosphere and flow control peninsula structure between the fill port channel and a portion of the inner cavity (peninsula between 34 and 18) and extending at least partially into the inner enclosure and being configured to control the flow of fluid into the inner cavity; further comprising locking features formed on the flow control structure as tapered sections that form a choke point at an intermediate portion of the fill port channel (34).

Regarding claims 32, 35-36, 39 and 41, Jordan et al. discloses a micro-electromechanical (MEMS) assembly, comprising: a MEMS device disposed at least partially within a package, wherein the package includes an inner enclosure having

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an inner cavity (fig. 1, 18) defined therein, and a fill port channel coupling the inner cavity to an atmosphere and physically separating the atmosphere and the inner cavity by a distance sufficient to allow a variable flow of adhesive to enter the fill port channel (34) while preventing the adhesive from entering the inner cavity; and an adhesive seal coupled to the fill port channel; wherein the adhesive is physically separated from the MEMS device by the flow control structure (adhesive 30 separated by peninsula between 34 and 18); further comprising locking features formed in the fill port channel and wherein the adhesive seal is locked in the fill port channel by the locking features; and wherein the adhesive seal comprises a thermoset epoxy (30, melted glass epoxy).

Regarding claims 43-47, Jordan et al. discloses a method of forming a package for a micro-electromechanical device (MEMS device), comprising: forming an inner enclosure having an inner cavity (fig. 1, 18) defined therein and forming a fill port channel (34), wherein the fill port channel is in fluid communication with an atmosphere and the inner cavity is of sufficient length to allow a variable flow of adhesive (30) to enter the fill port channel while preventing the adhesive from entering the inner cavity; wherein the fill port channel extends at least partially into the inner enclosure and further comprising forming a flow control structure to form the fill port channel and to physically separate the fill port channel from the inner cavity (peninsula between 34 and 18); wherein the flow control structure further comprises locking features that have a plurality of tapered sections which form a choke point at an intermediate portion of the fill port channel.

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Regarding claims 54-55, Jordan et al. discloses a MEMS package, comprising: means for containing a MEMS device (fig. 1, cavity 18); means for introducing a fluid to the means for containing the MEMS device (channel into fill port 34); and means for separating a portion of the means for containing the MEMS device from the means for introducing the fluid (peninsula between 34 and 18); and means for locking an adhesive within the means for introducing the fluid (34).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jordan et al. '862 in view of Bower et al. '466.

Jordan et al. discloses all of the elements of the claim(s) as set forth in paragraph 4 above, but the reference does not explicitly disclose the inner cavity to contain a degassed packaging fluid. Bower et al. teaches a MEMS package assembly wherein an inner cavity contains a degassed packaging fluid (col. 2, lines 46-62).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the degassed packaging fluid of Bower et al. in the MEMS assembly of Jordan et al. One would have been motivated to do this because Bower et al. taught that it was conventional for MEMS packages to be filled

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with a degassed fluid (col. 2, lines 46-62), which was well known in art to lubricate MEMS devices and prevent wear and stiction, and Bower et al. also taught that degassed fluids prevent bubbles and gaseous pockets from occurring inside the cavity (col. 1, lines 17-21), thus allowing the device to be better lubricated.

7. Claims 37-38, 40 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jordan et al. '862.

Jordan et al. discloses all of the elements of the claim(s) as set forth in paragraph 4 above, but the reference does not explicitly disclose the adhesive seal comprise a photoresist, a solder, a UV curable epoxy or a moisture cure adhesive. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a photoresist, a solder, a UV curable epoxy or a moisture cure adhesive in the package of Jordan et al. because adhesive seals comprising a photoresist, a solder, a UV curable epoxy or a moisture cure adhesive were well known, functional equivalents of a thermoset epoxy used to seal MEMS packages.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Michael et al. '283, Tilmans et al. '649, Heck et al. '916, Lutz et al. '367 and Cheung '494 disclose a package for a MEMS device having an inner cavity and a fill port that is closed with adhesive.

Inohara et al. '557, McKenna et al. '931 and Park '699 disclose a package for a semiconductor device having an inner cavity and a fill port that is closed with adhesive.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven J. Fulk whose telephone number is (571) 272-8323. The examiner can normally be reached on Monday through Friday, 9:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571) 272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SJF

Steven J. Fulk
Patent Examiner
Art Unit 2891

June 6, 2007



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